

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In re Application of:

Masahiko KUBO

Application No. 09/721,944

Filed: November 27, 2000

For: A COLOR IMAGE PROCESSING
METHOD AND A COLOR IMAGE
PROCESSOR

)
) Confirmation No.: 4297
)
) Group Art Unit: 2626
)
) Examiner: T. Carter
)
)
) **Mail Stop Amendment**
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)
)

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2011 South Clark Place
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Crystal Plaza Two, Lobby, Room 1B03
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Sir:

SUBMISSION OF REPLACEMENT DRAWINGS

In response to the Office Action dated July 2, 2004, transmitted herewith are nine (9) sheets of replacement drawings to be substituted for the corresponding sheets originally filed in the above-identified application.

In response to the Office Action dated July 2, 2004, these sheets replace the original drawing sheets encompassing FIGS. 1-9. FIGS 1-9 have been revised to include the appropriate English translation identifying each drawings.

Respectfully submitted,

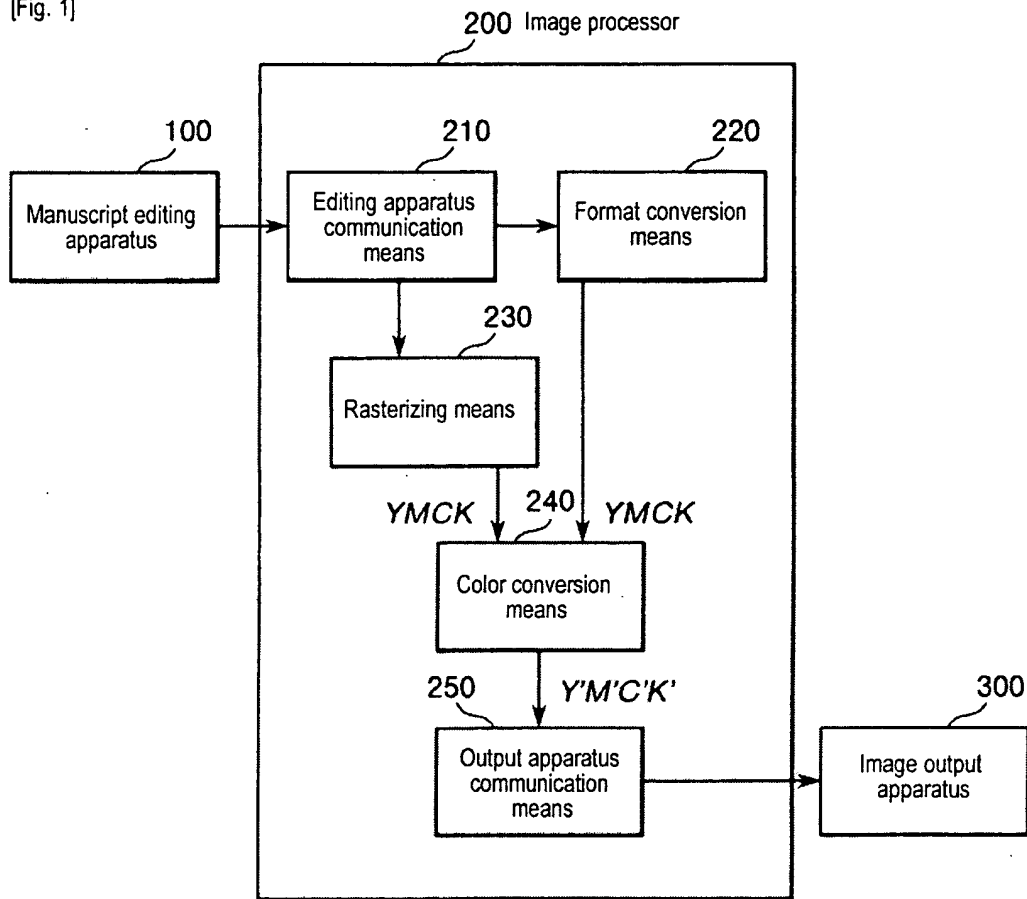
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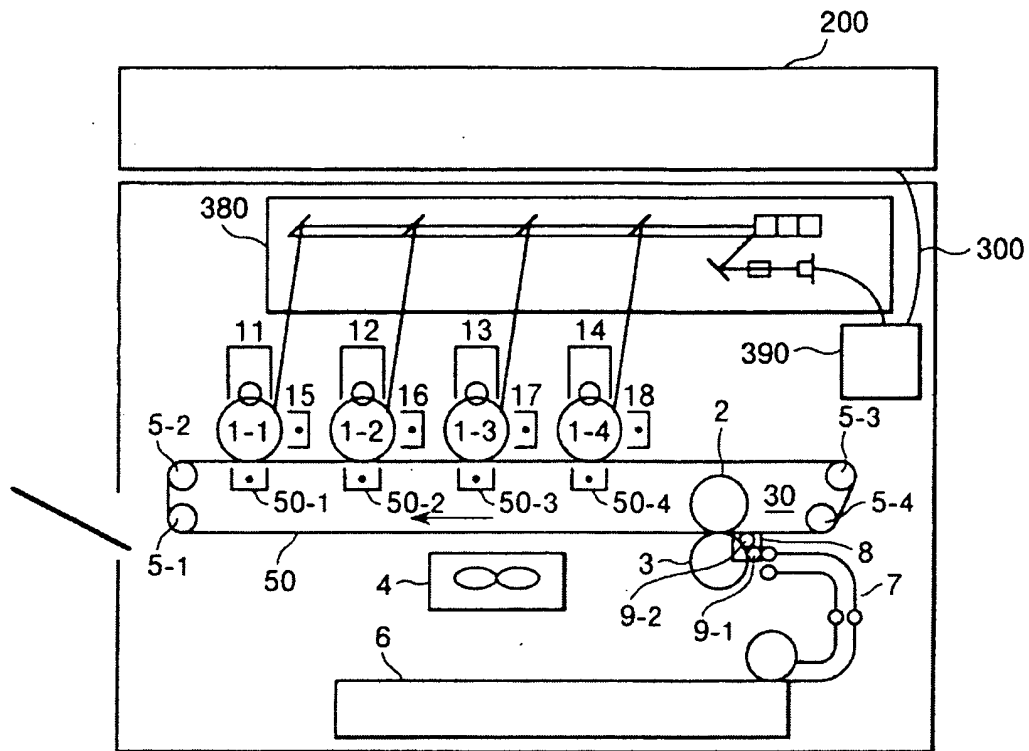
REPLACEMENT SHEET

[Fig. 1]



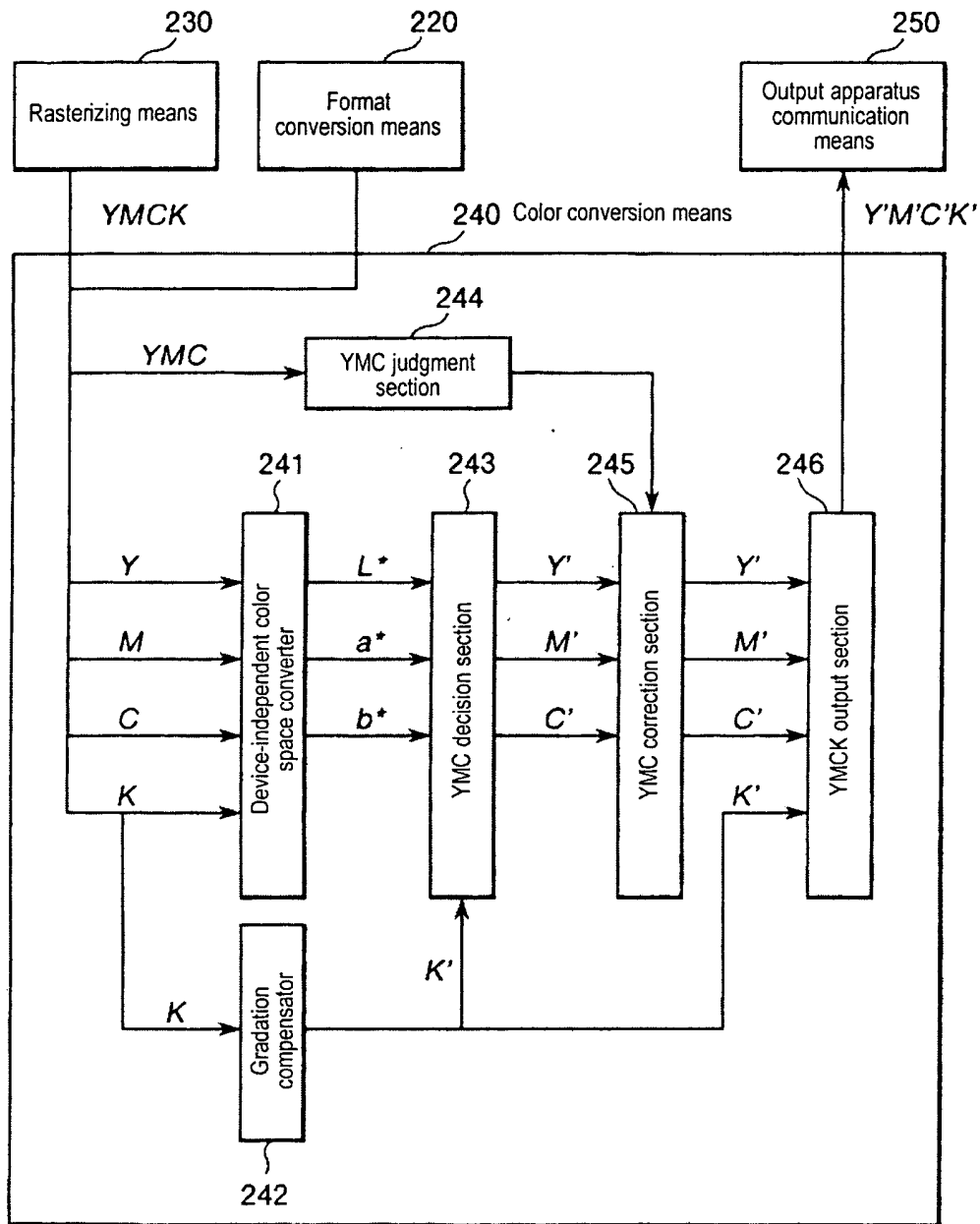
REPLACEMENT SHEET

[Fig. 2]



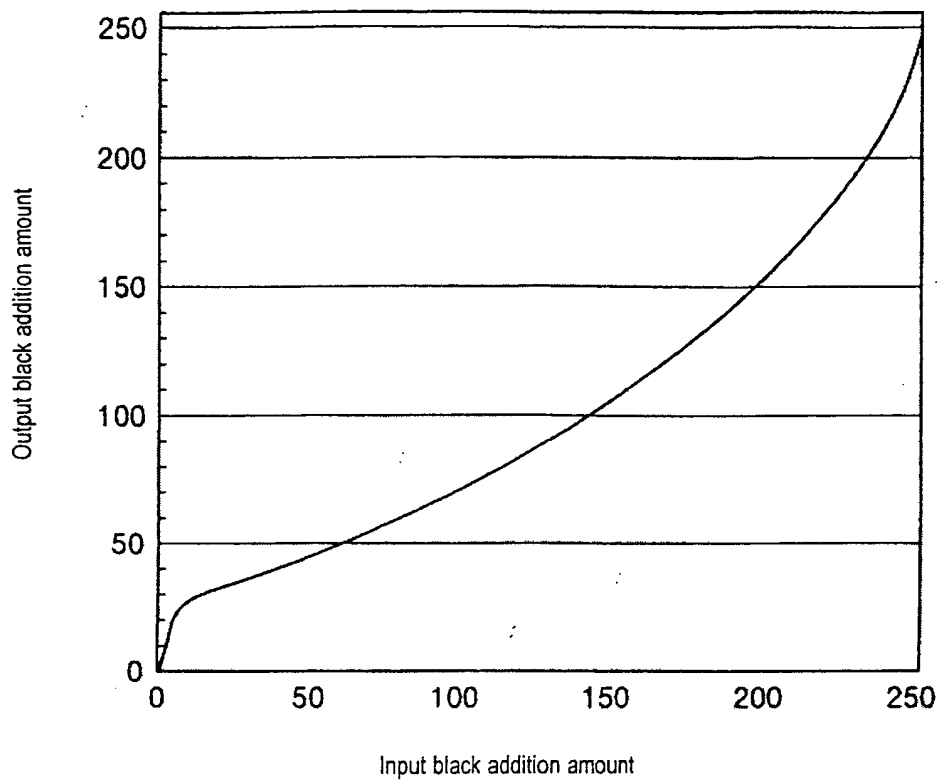
REPLACEMENT SHEET

[Fig. 3]



REPLACEMENT SHEET

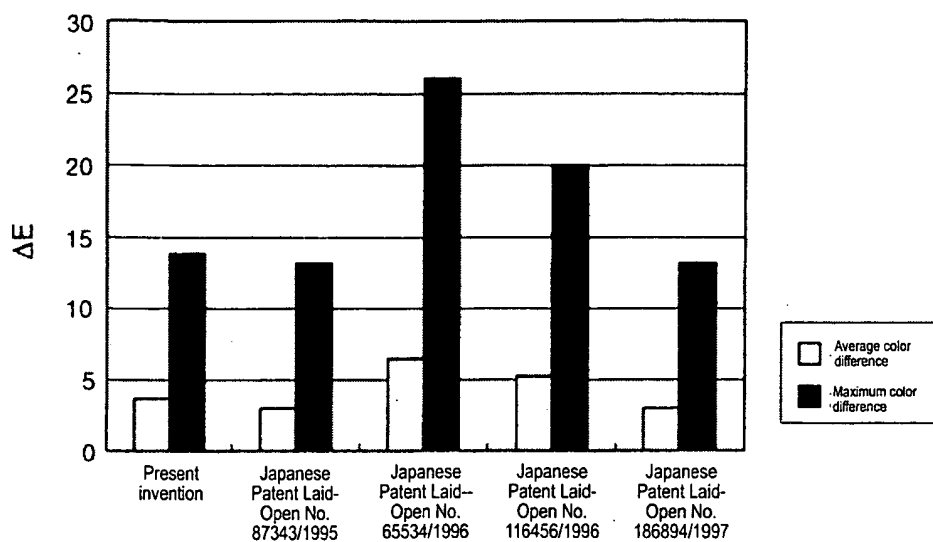
[Fig. 4]



REPLACEMENT SHEET

[Fig. 5]

Comparison of color conversion accuracy
between the present invention and related art



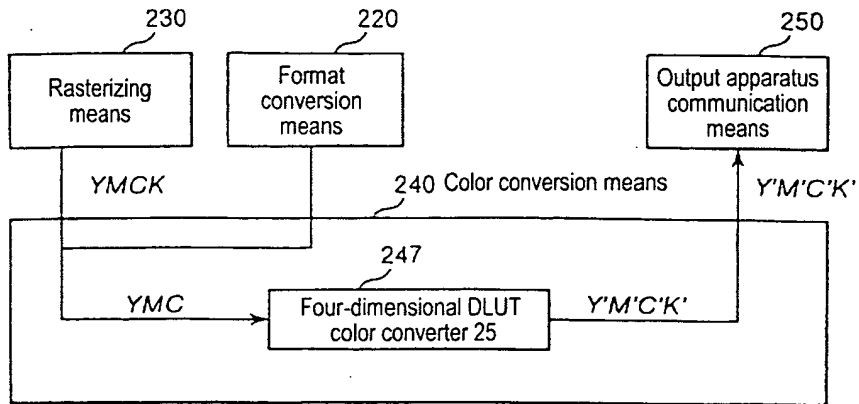
Comparison of reproduction in a single black color between the present invention and related art

Color conversion system	Present invention	Japanese Patent Laid-Open No. 87343/1995	Japanese Patent Laid-Open No. 65534/1996	Japanese Patent Laid-Open No. 116456/1996	Japanese Patent Laid-Open No. 186894/1997
Reproduction in a single black color	○	×	○	○	×

Legend:
 ○ Reproduction in a single black color possible
 × Reproduction in a single black color impossible

REPLACEMENT SHEET

[Fig. 6]



REPLACEMENT SHEET

[Fig. 7]

Step1

A color patch is printed out corresponding to an arbitrary combination of printing color signals Y, M, C and K and the colorimetric values color signals Y, M, C and K are measured.

Step2

Neural Network 1 is instructed to study a data set of Y, M, C and K and $L^*a^*b^*$ as instructor data.

Step3

A color patch corresponding to an arbitrary combination of image recording signals Y', M', C' and K' for the image output apparatus 300 is printed out and the colorimetric values $L^{**}a^{**}b^{**}$ are measured.

Step4

Neural Network 2 is instructed to study a data set of Y', M', C' and K' and $L^{**}a^{**}b^{**}$ as instructor data.

Step5

Colorimetric values $L^*a^*b^*$ for the input address values Y, M, C and K of the four-dimensional DLUT color converter are determined by using Neural Network 1.

Step6

Black addition amount K' for the image output apparatus that has an equivalent lightness to that of the input address value K of the four-dimensional DLUT color converter is determined by using the one-dimensional lookup table.

Step7

By solving Neural Network 2 by using the numerical solution from the colorimetric values $L^*a^*b^*$ and the black addition amount K', colorimetrically consistent values Y', M' and C' are calculated.

Step8

When the input address values Y, M and C of the four-dimensional DLUT color converter are all zero, calculated values Y', M' and C' are all corrected to be zero.

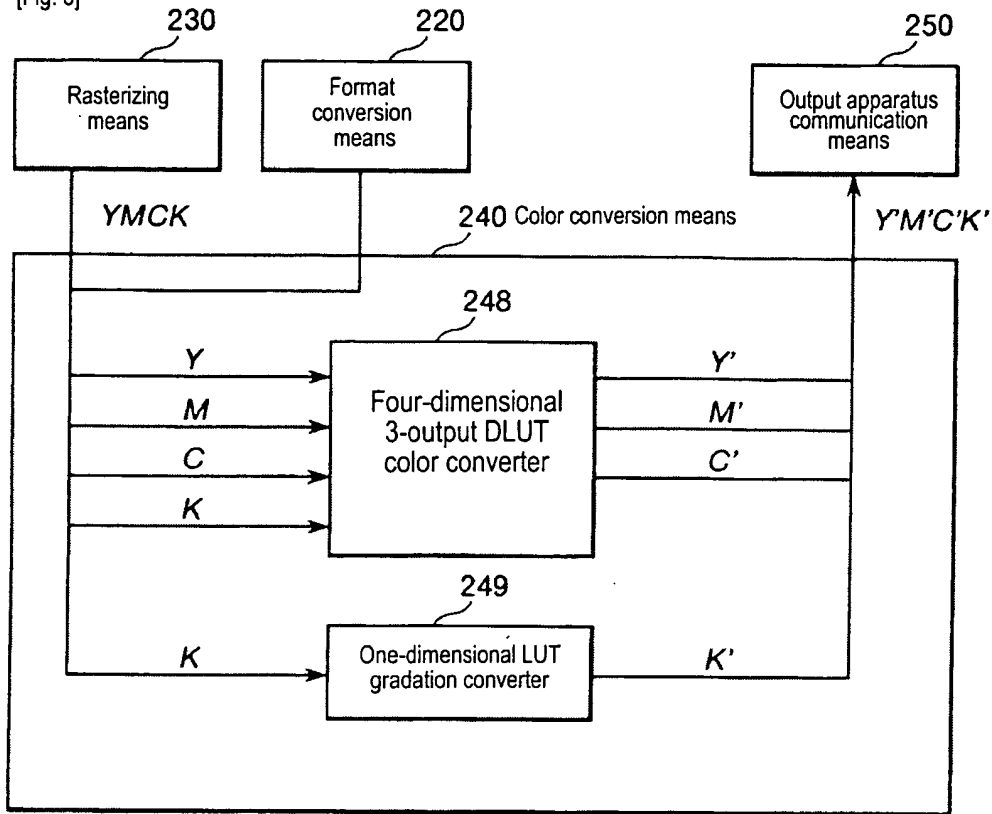
Step9

Obtained Y', M' and C' and black addition amount K' are set to lattice points of the four-dimensional DLUT color converter.



REPLACEMENT SHEET

[Fig. 8]



REPLACEMENT SHEET

[Fig. 9]

Step1'

A color patch is printed out corresponding to an arbitrary combination of printing color signals Y, M, C and K and the colorimetric values color signals Y, M, C and K are measured.

Step2'

Neural Network 1 is instructed to study a data set of Y, M, C and K and $L^*a^*b^*$ as instructor data.

Step3'

A color patch corresponding to an arbitrary combination of image recording signals Y' , M' , C' and K' for the image output apparatus 300 is printed out and the colorimetric values $L^*a^*b^*$ are measured.

Step4'

Neural Network 2 is instructed to study a data set of Y' , M' , C' and K' and $L^*a^*b^*$ as instructor data.

Step5'

Colorimetric values $L^*a^*b^*$ for the input address values Y, M, C and K of the four-dimensional DLUT color converter are determined by using Neural Network 1.

Step6'

Black addition amount K' for the image output apparatus that has an equivalent lightness to that of the input address value K of the four-dimensional DLUT color converter is determined by using the one-dimensional lookup table.

Step7'

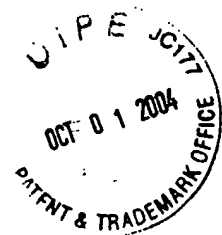
By solving Neural Network 2 by using the numerical solution from the colorimetric values $L^*a^*b^*$ and the black addition amount K' , colorimetrically consistent values Y' , M' and C' are calculated.

Step8'

When the input address values Y, M and C of the 4-input 3 output DLUT color converter are all zero, calculated values Y' , M' and C' are all corrected to be zero.

Step9'

Obtained Y' , M' and C' and black addition amount K' are set to lattice points of the four-dimensional DLUT color converter.



IN THE DRAWINGS:

The attached sheets of drawings include changes to FIGS. 1 through 9. These sheets replace the original drawing sheets encompassing FIGS. 1 through 9. FIGS. 1 through 9 have been revised to include the appropriate English translation identifying each drawings.

Attachment: Nine Replacement Sheets